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Pressure Type Cooling System*

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The "sealed" or pressure type of cooling system is the most recent widely used method of minimizing cooling solution losses from expansion and evaporation.

This type of system, as the name implies, keeps the cooling fluid sealed within the system at normal operating temperatures, and is opened to the atmosphere only when a predetermined pressure is reached, and at a temperature considerably above the normal boiling point of the solution.

Obviously, the sealed cooling system is of particular value when cars are operated in cold weather with alcohol or other volatile anti-freezes, as the boiling point of the anti-freeze solution is raised 10° to 20°, depending on the pressure setting of the valve.

The benefits of this design are equally evident under other circumstances. The boiling point of the solution at high altitudes is raised, providing better cooling for mountain driving. And, under all conditions, higher engine operating temperatures are permitted, which result in increased economy and cooling system efficiency.

The pressure type of cooling system has been used on Cadillac and LaSalle cars from 1936 up to the present time, and has also been used on a number of other cars. The following description applies specifically to the Cadillac-LaSalle construction, although it is typical of the other systems.

The main points of difference between the pressure type cooling system and the conventional system are in the filler cap and the overflow pipe, the two points where air can enter the conventional system.

The filler cap is designed to provide a leak-proof seal with the filler neck, and it

incorporates a valve to vent the system when the internal pressure rises to a predetermined point, and another valve to permit the re-entry of air if required to avoid a vacuum when the system cools. The radiator overflow pipe, accordingly, instead of extending into the radiator upper tank, leads into the filler neckhousing outside of the radiator cap valve.

Normally, then, there is no connection between the system and the overflow pipe. However, when the system becomes warm enough so that the predetermined pressure is reached, the valve in the filler cap is forced open and the system is vented to the overflow pipe.

The pressure at which the valve opens depends entirely on the design of the system. In some systems, a pressure as low as 3 lbs. is considered adequate. In others, pressures up to 7 or 8, or even 10 lbs. are used. This is a design problem which need not concern service men.

In servicing a car with the pressure type cooling system, service men must observe certain precautions when checking the liquid level, when adding liquid, or when draining and refilling the entire system. These precautions are:

Vent System Thoroughly Before Removing Radiator Cap

Before removing the cap from a hot engine, be sure to vent the system thoroughly. **THIS IS IMPORTANT.**

Pressure type caps are so designed that they can be unscrewed partway to a vented position, in which the pressure is relieved through the overflow pipe. In recent series

Cadillac-LaSalle cars, this is done by turning the cap counter-clockwise about one-half turn until a stop is reached. After the cap has been left in the vented position for a few moments and there is no sound of escaping steam, the cap can be turned the rest of the way for removal. If this is not done, there is danger of personal injury from steam and hot water.

Reinstall Radiator Cap Tightly

It is important also when reinstalling these caps to turn the cap all the way on. If the cap is only installed part-way and is left in the vented position, the car owner will not derive the benefit of the sealed system, and under some circumstances excessive amount of cooling liquid will be lost.

Remove Cap to Drain Cooling System

When draining the cooling system, always remove the radiator cap. This is obviously a help to speedy draining with any type of cooling system. With some sealed systems, however, it is almost impossible to drain the system completely unless the filler cap has been removed.

When performing maintenance work on this type of cooling system, it is important to remember that the system must not only be leak-proof, but leak-proof under considerable pressure. The sealed system, therefore, requires greater care in keeping pump packings, hose connections and cylinder heads well tightened.

It is also advisable to check the condition of the gasket regularly and to clean any accumulated scale off of the cap to prevent leaks from developing.

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Telescoping Type Shock Absorbers*

When They Can Be Serviced and When They Have To Be Sent Out For Service

While the telescoping type of shock absorbers used on all 1940 makes of cars are fundamentally the same, the weight and spring action of individual makes and types of cars must be taken into consideration so that the shock absorber will function properly under the requirements presented for the particular car on which it is to be used.

Shock absorbers used on present day cars are accepted by the motoring public as units that are used to provide a smoother ride and prevent road shock from being transmitted to the steering wheel and car body. Beyond this, the car owner knows little or nothing about these units. In fact, it is very seldom that the car owner ever asks to have the shock absorbers inspected, and while manufacturers recommend that these units be checked at intervals of from 5,000 to 10,000 miles, or twice a year, many car owners admit that they have never had them inspected.

While telescoping type shock absorbers are so constructed that only infrequent inspection is recommended, there is always the possibility that the fluid may have leaked out due to distortion of the shock absorber mountings or shock absorber unit. Minor accidents of a nature which would not distort the car frame and front end might damage the shock absorber or mountings and not be noticed. If a slow leak develops due to such a circumstance, even an experienced driver would undoubtedly not notice it.

The efficiency of a shock absorber is comparable with that of an engine. If the efficiency of an engine drops off gradually over a long period of time, it usually goes unnoticed until some major part fails. The same is true of a shock absorber unit, and the driver does not notice it until the springs become "jumpy" or possibly until the car doesn't steer as it should.

Some telescoping type shock absorbers used previous to 1940 were equipped with plugs, and it is possible to refill some of these units without dismounting them. However, due to the necessity of using an exactly correct amount of fluid (accurate to $\frac{1}{4}$ oz.) and because there is no way of determining the quantity of fluid remaining in the unit while it is mounted on the car, manufacturers prefer that shock absorbers be referred to an authorized dealer for service.

On 1940 and some previous models, some shock absorbers are not provided with filler plugs. The entire unit must be dismounted from the car, and all service done on the bench. This means that the refilling of these units should be done by an authorized dealer as special tools are required to service the unit, and unless the operator has had a thorough schooling in this line of service, it should not be attempted.

A drive by one of the largest service equipment companies is now being made to stock service stations with spare telescoping shock absorbers to be used as "loaners"

similar to battery recharge service. With these in stock, the service attendant can quickly remove the shock absorber from the car and install the "loaner". The other, he sends out to have serviced and returned. The rental fee charged for this service will cover the labor charges, and possibly a little extra profit. It will place the service station on the list of those prepared to give quick service and satisfied customers will broadcast this fact.

Some of the assemblies used in these telescoping type shock absorbers are of very intricate and delicate construction. For instance, in the rebound valve assemblies, the valve parts are as intricate and nearly as small as those used in a clock, clearly illustrating the fallacy of any one except a schooled mechanic in this line trying to service these units.

In filling these shock absorbers, it is important that the exact amount of fluid be used. Since the correct amount varies due to shock absorber size, spring action, and weight of car superstructure, the units used on different cars require different quantities of fluid. Also, since the amount of fluid must be accurate to a fraction of an ounce, special graduated measuring equipment must be used. It is obvious, therefore, that manufacturers of these shock absorber units have just reasons for recommending that they be serviced **ONLY** by an authorized dealer is warranty is to apply.

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Interesting Facts Concerning Automobiles and Their Use of Rubber

Excerpts from a Broadcast by Harvey S. Firestone Jr.

Back in 1900, when the first National Automobile Show was held in the old Madison Square Garden, there were only 8,000 motor vehicles in the United States. Today, on its fortieth anniversary, there are nearly 30 million, which are 68 per cent of all the motor vehicles in the world.

The building of automobiles has become the largest manufacturing industry in the world. Here in the United States it employs, directly or indirectly, more than 6 million workers and has an annual payroll of 7 billions of dollars. From its beginning in 1900, 84 billions of dollars have been paid out in wages to workers, of which 14 billions went directly to its factory em-

ployees, 7 billions to workers in allied industries such as steel, rubber and petroleum, 13 billions to road builders, and 50 billions to others such as chauffeurs, truck drivers, repair men and service station employees. So important has this great industry become to our national welfare that it is now regarded as the most vital single economic force in the commerce of the United States. Today it stands as a world-wide symbol of American progress and prosperity.

It is a most significant fact that rubber tires form the only contact which the automobile has with the road. Each time your car starts, moves or stops, the necessary force can be transmitted only through your

tires. Consequently, as higher speeds, heavier traffic and more efficient braking have evolved, they have placed heavier and heavier demands upon rubber tires. To meet these greater needs, stronger tire bodies, tougher tire treads, and more effective non-skid designs have been developed. And with these greater contributions to tire safety have also come truly remarkable increases in economy.

In 1913, for instance, a first-quality tire for a popular-priced car sold for \$22.80 and delivered approximately 3,500 miles of service. Today, a first-quality tire for the same kind of car sells for \$15.95 and aver-

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WILLIAM E. CALLAGHAN

William E. Callaghan, 63, Jackson, Mich., president of Motor State Oil & Grease Co., died suddenly Dec. 6 at Battle Creek, Mich., while on a business trip. He entered the oil business in 1904. Two of his brothers surviving, Andrew J. Callaghan, Chicago, vice-president of American Oil & Grease Co., and Paul W. Callaghan, Jackson, Mich., of Paul Callaghan Sales Co., are oil men. He leaves also a widow, Mrs. Rose Callaghan, four children, a brother, John P. Callaghan, Detroit, and sister, Mrs. William M. Normile, Cleveland.

JOHN CURRY BATTENFELD

John Curry Battenfeld, 19 years old, younger son of Mr. and Mrs. J. R. Battenfeld, Kansas City, Mo. was fatally injured while returning from the University of Kansas, at Lawrence, where he was in his Junior year majoring in Business Administration.

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ages 27,000 miles. This means that the motorist of 25 years ago paid \$11.00 for the same tire value that today he can buy for \$1.00.

In the early days of the automotive industry, its use of rubber was restricted almost exclusively to tires; but in recent years its demand for other rubber products has increased rapidly, and one of the outstanding improvements in the new cars of today is the widespread use of rubber to eliminate noise, reduce vibration, improve riding comfort and increase safety. In fact, as many as 300 rubber parts are now used in the modern motor car. The adoption of rubber latex cushioning materials, introduces a new note of luxury in motoring. Rubber bushings in spring shackles replace old-fashioned grease cups and silence annoying squeaks. With the help of rubber, silence has been engineered into doors and bodies and dozens of other metal-to-metal contacts have been eliminated. Many of these rubber parts are hidden away inside the car. You may never see them—yet silently and permanently they do their useful work.

Car Mfgs. Latest Recommendations*

NEW TYPE DOOR HINGES ON 1940 BUICKS

A new type of door hinge, with an "oil-less" bushing requiring no lubrication, has been perfected and is being put into full production as rapidly as possible. At present, the front upper hinges on Buick Series 50 and 70 bodies and the front lower hinges on Series 40 and 60 bodies are of the new type. Eventually, all door hinge bushings on Series 40 to 90 inclusive will be of the oil-less type.

The new hinges are readily distinguished from the old by reason of omission of the oil-hole. No lubricant should be used on the oil-less bushing type hinge.

BUICK REAR WHEEL BEARINGS

Buick has made a change in the recommendation for rear wheel bearing lubrication, and now recommends that rear wheels be removed for lubrication of the bearings with Wheel Bearing Grease every 10,000 miles, or whenever brakes are relined.

This recommendation has not been made retroactive. However, the Buick Service Department suggests that, although it is not absolutely necessary that rear wheel bearings on models previous to 1940 be removed and repacked with lubricant, it is advisable.

CROSLY CHANGES PROPELLER SHAFT CONSTRUCTION

On early 1940 Crosley models the propeller shaft spline is equipped with a fitting through which Chassis Lubricant should be applied every 1,000 miles.

A change has been made in production, and on models now being produced the propeller shaft spline is automatically lubricated

It is not surprising that the American people are giving the new 1940 motor cars such an enthusiastic reception. In these cars are combined all that is best in engineering practice and scientific research. They embody the untiring efforts of scientists and engineers to anticipate today the automotive needs of tomorrow. They stand as a symbol of the unceasing determination of the automobile industry to keep in the forefront of the march of progress.

HEADLIGHTS ON OLDER CARS CAN BE IMPROVED

Owners of cars of the vintage of 1939, or older, are asking why the new Sealed Beam headlamps couldn't have been developed years ago so that they, too, could have the advantage of the increased night illumination built into the new Sealed Beam headlamps. The answer is that "Time Marches On," and this is particularly true in automotive design.

from the transmission and requires no further lubrication.

CHRYSLER CROWN IMPERIAL (C27) 1940 DIFFERENTIAL DRAIN AND FILLER PLUGS

The differential drain and filler plugs on this model are located in different positions from those for the rest of the line, with which service stations have become familiar in recent years. The filler plug is located on the forward side of the rear axle in the drive pinion carrier casting. The drain plug is a small pipe plug located at the base of the cover plate at the rear center of the axle housing.

1940 FORD STABILIZER SWIVEL

Inquiries from the field indicate that there is some misunderstanding regarding the lubrication of the stabilizer swivel on the Ford 85 and De Luxe and the Mercury 8, 1940 models. Those making inquiries stated that they understood that a rubber joint was used at this point and that no lubrication was required.

The swivel is *not* rubber mounted, but is equipped with a fitting, through which Chassis Lubricant should be applied every 1,000 miles.

ADJUSTING THE OLDSMOBILE HYDRA-MATIC TRANSMISSION

Motor Age for December, 1939 carries a story with drawings and illustrations on this subject that will be of interest to those who wish to study this new design and be prepared to service it. Write *Motor Age*, Chestnut and 56th Sts., Philadelphia, Pa.

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Car manufacturers in the past have designed their headlamps to conform to lines most pleasing to the general hood and front and design of the car. This is also true of 1940 designs using the Sealed Beam headlamps, but previous to 1940 the lamp housings or casings were of various sizes, shapes and diameters. Because of the higher generator output necessary, the difference in wiring, etc., the new Sealed Beam unit cannot be used in former year headlamp casings.

It therefore becomes natural for owners of older cars to ask if something cannot be done to their present headlamps to increase night illumination. Indeed there are several things that can be done. Headlamps gradually become less efficient as the car becomes older. After a car has been driven from two to three years, the light output may be reduced to two-thirds its original

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brilliance. The car owner seldom realizes this because the loss in light output has taken place so gradually that it could not be recognized. Here is where the petroleum service station can render a service that will not only increase night illumination one-third, but will also make night driving more enjoyable and safe.

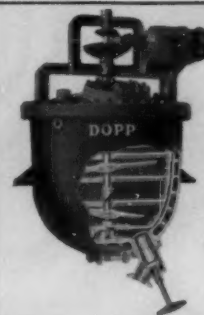
Headlamp bulbs are subject to the same deterioration as light bulbs used in homes, and gradually become weaker and blackened. Replacement of bulbs, cleaning of lenses both inside and outside, polishing or replacing of reflectors and re-aiming and adjusting the beam, will often double the light output of older headlamps.

Here is an opportunity for the service stations to make a nice profit, and at the same time provide a much needed service that will be appreciated by owners of older cars.

Before starting a real money-making drive for this service, some preliminary work should be done. Bulbs should be ordered, a cleaning compound for polishing reflectors should be stocked, and arrangements made for securing the proper make and size of replacement reflectors without delay, in order that the job may be done quickly. If a screen for use in aiming the beam is lacking, one should be ordered. In other words, be prepared to do a complete job of headlamp reconditioning—the additional amount of money coming into the cash register will be surprising.

**SMALL SEALED BEAM LIGHTS AVAILABLE
AS AN ACCESSORY**

While the new Sealed Beam headlamp unit cannot be installed on older cars, several companies are now manufacturing a small Sealed Beam auxiliary lamp (5½ in. diameter) to be used as an extra or driving light with any existing headlamp systems. These can be mounted on the front frame extension or front bumper of any car, and complete instructions for mounting and connecting the necessary wiring to the present headlamp wiring accompanies the lamps. Among companies supplying these new small Sealed Beam auxiliary lamps, and who will be glad to give you additional information and prices, etc., are: General Electric Company, Lamp Department, Nela Park, Cleveland, Ohio, and Westinghouse Electric & Manufacturing Company, Lamp Division, Bloomfield, New Jersey.



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